IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: William Steven Lanier et al.	***Customer No. 21967***
Application No.: Unassigned	Group Art Unit: Unassigned
Filed: March 6, 2002	Examiner: Unassigned
Title (as amended herein): METHOD OF DETERMINING MEASUREMENT BIAS IN AN EMISSIONS MONITORING SYSTEM	Att'y Dkt. No.: 59589.000032

Assistant Commissioner for Patents
Washington, D.C. 20231

March 6, 2002

PRELIMINARY AMENDMENT

Sir:

The present application is a continuation of U.S. Application Serial No. 09/682,900, entitled METHOD AND SYSTEM FOR MONITORING COMBUSTION SOURCE EMISSIONS. Preliminary to the examination of the continuation application, please enter the following amendments to the specification and claims as filed in the parent application:

In the Title:

On page 1 and wherever applicable, please replace the title with the following:

METHOD OF DETERMINING MEASUREMENT BIAS IN AN EMISSIONS MONITORING SYSTEM

In the Specification:

On page 1, before paragraph 1, please insert the following:

This application is a continuation of pending prior application Serial No. 09/682,900 filed October 31, 2001.

In the Claims:

Please delete claims 1-34.

Please insert new claims 35-53 as follows:

35. In an emissions monitoring system, a method of determining bias in a measurement of a constituent concentration level in a sample gas, the method comprising:

establishing a sample gas flow from an emission stream into a sample gas line;

removing water from the sample gas flow and cooling the sample gas flow to a temperature below about 41 °F to produce a cooled, dried sample gas flow;

determining the constituent concentration level for the cooled, dried sample gas flow;

introducing a span gas having a known span gas constituent concentration level into the sample gas flow to form a combined sample and span gas flow, the span gas being introduced at a desired span gas flow rate;

removing water from the combined sample and span gas and cooling the combined sample and span gas to a temperature below about 41 °F to produce a cooled, dried, combined sample and span gas flow;

determining a combined sample and span gas constituent concentration level for the cooled, dried, combined sample and span gas flow; and

determining a measurement bias using the known span gas constituent concentration level, the sample gas constituent concentration level and the combined sample and span gas constituent concentration level.

36. A method according to claim 35 further comprising the steps of:

measuring a sample flow rate of the cooled, dried sample gas flow; and

measuring a combined gas flow rate of the cooled, dried, combined sample and span gas flow.

37. A method according to claim 36 further comprising the steps of:

determining a concentration level of a secondary constituent in the cooled, dried sample gas;

correcting the sample flow rate using the secondary constituent concentration level in the cooled, dried sample gas flow;

determining a concentration level of the secondary constituent in the combined, cooled, dried span and sample gas flow; and

correcting the combined gas flow rate using the secondary constituent concentration level in the combined cooled, dried sample and span gas flow.

38. A method according to claim 37 wherein the secondary constituent is one or more of water, O_2 and CO_2.

39. A method according to claim 35 further comprising the step of:

calculating the desired span gas flow rate using a desired combined sample and span gas constituent concentration level, the sample gas flow rate and the span gas constituent concentration level.

40. A method according to claim 39 wherein the desired combined sample and span gas constituent concentration level is calculated using a predetermined ratio of span gas constituent concentration level to combined sample and span gas constituent concentration level.

41. In an emissions monitoring system, a method of determining bias in a measurement of a constituent concentration level in a sample gas, the method comprising:

establishing a sample gas flow from an emission stream into a sample gas line;

removing water from the sample gas flow and cooling the sample gas flow to a temperature below about 41 °F to produce a cooled, dried sample gas flow;

measuring a sample flow rate of the cooled, dried sample gas flow;

determining the constituent concentration level for the cooled, dried sample gas flow;

introducing a span gas having a known span gas constituent concentration level into the sample gas flow to form a combined sample and span gas flow, the span gas being introduced at a desired span gas flow rate;

removing water from the combined sample and span gas and cooling the combined sample and span gas to a temperature below about 41 °F to produce a cooled, dried, combined sample and span gas flow;

measuring a combined gas flow rate of the cooled, dried, combined sample and span gas flow;

determining a combined sample and span gas constituent concentration level for the cooled, dried, combined sample and span gas flow; and

determining a measurement bias using the known span gas constituent concentration level, the sample gas constituent concentration level and the combined sample and span gas constituent concentration level.

42. A method according to claim 41 further comprising the steps of:

determining a concentration level of a secondary constituent in the cooled, dried sample gas;

correcting the sample flow rate using the secondary constituent concentration level in the cooled, dried sample gas flow;

determining a concentration level of the secondary constituent in the combined, cooled, dried span and sample gas flow; and

correcting the combined gas flow rate using the secondary constituent concentration level in the combined cooled, dried sample and span gas flow.

43. A method according to claim 42 wherein the secondary constituent is one or more of water, O_2 and CO_2.

44. A method according to claim 41 further comprising the step of:

calculating the desired span gas flow rate using a desired combined sample and span gas constituent concentration level, the sample gas flow rate and the span gas constituent concentration level.

45. A method according to claim 44 wherein the desired combined sample and span gas constituent concentration level is calculated using a predetermined ratio of span gas constituent concentration level to combined sample and span gas constituent concentration level.

46. In an emissions monitoring system, a method of determining bias in a measurement of a constituent concentration level in a sample gas, the method comprising:

establishing a sample gas flow from an emission stream into a sample gas line;

passing the sample gas flow through a dryer to produce a dried sample gas flow;

determining the constituent concentration level for the dried sample gas flow;

introducing a span gas having a known span gas constituent concentration level into the sample gas flow to form a combined sample and span gas flow, the span gas being introduced at a desired span gas flow rate;

passing the combined sample and span gas through the dryer to produce a dried, combined sample and span gas flow;

determining a combined sample and span gas constituent concentration level for the dried combined sample and span gas flow; and

determining a measurement bias using the known span gas constituent concentration level, the sample gas constituent concentration level and the combined sample and span gas constituent concentration level.

47. A method according to claim 46 wherein the dried sample gas flow and the dried, combined sample and span gas flow, each have a moisture content below that of an equivalent gas that would be saturated at about 41 °F.

48. A method according to claim 46 wherein the dryer includes a refrigerated dryer unit configured for lowering the temperature of the sample gas flow and the combined sample and span gas flow to a temperature below a dew point of the sample gas flow and a dew point of the combined sample and span gas flow, respectively.

49. A method according to claim 46 further comprising the steps of:

measuring a sample flow rate of the cooled, dried sample gas flow; and

measuring a combined gas flow rate of the cooled, dried, combined sample and span gas flow.

50. A method according to claim 49 further comprising the steps of:

determining a concentration level of a secondary constituent in the cooled, dried sample gas;

correcting the sample flow rate using the secondary constituent concentration level in the cooled, dried sample gas flow;

determining a concentration level of the secondary constituent in the combined, cooled, dried span and sample gas flow; and

correcting the combined gas flow rate using the secondary constituent concentration level in the combined cooled, dried sample and span gas flow.

51. A method according to claim 50 wherein the secondary constituent is one or more of water, O_2 and CO_2.

52. A method according to claim 46 further comprising the step of:

calculating the desired span gas flow rate using a desired combined sample and span gas constituent concentration level, the sample gas flow rate and the span gas constituent concentration level.

53. A method according to claim 52 wherein the desired combined sample and span gas constituent concentration level is calculated using a predetermined ratio of span gas

constituent concentration level to combined sample and span gas constituent concentration level.

In the Abstract:

Please replace the abstract paragraph with the following:

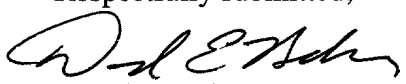
A method of determining bias in a measurement of a constituent concentration level in a sample gas is provided. The method comprises establishing a sample gas flow from an emission stream into a sample gas line of an emissions monitoring system. The method further comprises removing water from the sample gas flow and cooling the sample gas flow to a temperature below about 41 °F to produce a cooled, dried sample gas flow. The constituent concentration level is then determined for the cooled, dried sample gas flow. The method further comprises introducing a span gas having a known span gas constituent concentration level into the sample gas flow to form a combined sample and span gas flow, the span gas being introduced at a desired span gas flow rate. The method still further comprises removing water from the combined sample and span gas and cooling the combined sample and span gas to a temperature below about 41 °F to produce a cooled, dried, combined sample and span gas flow. A combined sample and span gas constituent concentration level is then determined for the cooled, dried, combined sample and span gas flow. The method also comprises determining a measurement bias using the known span gas constituent concentration level, the sample gas constituent concentration level and the combined sample and span gas constituent concentration level.

REMARKS

By the present preliminary amendment, claims 1-34 are deleted and claims 35-53 are added. The Applicants believe that no new matter is presented in these claims. Support for claims 35-53 appears at paragraphs 52-61 of the specification and in Figures 2 and 4.

The Applicants therefore respectfully request that claims 35-53 of the present continuation application be examined, allowed and passed to issue. Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact the Applicants' undersigned representative.

Respectfully submitted,



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